NATIONAL ENERGY MANAGEMENT INSTITUTE COMMITTEE

Application to Become Nonresidential Mechanical Acceptance Test Technician Certification Provider under California Code of Regulations 2013 Title 24, Part 1, Sections 10-102 and 10-103-B, As Well As Part 6, Sections 120.5

Final Submittal

27 February 27, 2015

Notice

National Energy Management Institute Committee

8403 Arlington Blvd, Suite 100

Fairfax, VA 22031

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Preface

The National Energy Management Institute Committee (NEMIC) in partnership with the International Training Institute for the Sheet Metal Industry (ITI) and the National Energy Management Institute (NEMI) is submitting this application to become a nonresidential mechanical acceptance test training and certification provider under California Code of Regulations 2013 Title 24, Part 1, Sections 10-102 and 10-103-B, as well as Part 6, Sections 120.5 ("Application").

The Application has been submitted in several parts as indicated in the respective section.

Two parts have been updated to reflect the latest and correct status:

- Section Quality Assurance Program.
- Attachment 6.1. ANSI Certificate of Accreditation

All other sections have not been altered since the last submittal of July 31, 2014.

This document contain information that NEMIC and its partners, ITI and NEMI, consider to be of proprietary and confidential nature. Parts of this application were submitted to the CEC docket unit with requests for confidentiality in accordance with California Code of Regulations Title 20 § 2505 et seq. All requests have been granted.

All questions regarding this application should be addressed to the Principal Author:

Davor Novosel
Chief Technology Officer
National Energy Management Institute Committee
Principal Author
703-499-3869
dnovosel@nemiconline.org

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Contents

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Definitions

ANSI..... American National Standards Institute

Application ..... As used here refers to this document in its entirety as well as all supporting materials provided under the cover of this document or under separate cover pertaining to this document

ATE ..... Acceptance Test Employer

ATT ..... Acceptance Test Technician

ATTCP ..... Acceptance Test Technician Certification Provider

Certificate of Completion..... Certificates of attendance or participation are provided to individuals, here ATE or ATT, who have attended or participated in classes, courses, or other education/training programs or events (National Commission for Certifying Agencies' *Standards for the Accreditation of Certification Programs*).

Certification..... A voluntary process by which individuals, here ATE or ATT candidates, are evaluated against predetermined standards for knowledge, skills, or competencies. Participants who demonstrate that they meet the standards by successfully completing the assessment process are granted a time-limited credential. To retain the credential, certificants must maintain continued competence. The credential awarded by the certification program provider denotes that the participant possesses particular knowledge, skills, or competencies. (National Commission for Certifying Agencies' *Standards for the Accreditation of Certification Programs*)

CCR ..... California Code of Regulations

ICB ..... International Certification Board, a function of NEMIC

ISO ..... International Standards Organizations

ITI ..... International Training Institute

JATC..... Joint Apprenticeship Training Center

NEMI..... National Energy Management Institute

NEMIC ..... National Energy Management Institute Committee

SMACNA..... Sheet Metal and Air Conditioning Contractors' National Association

SMART..... International Association of Sheet Metal, Air, Rail Transportation Workers (formerly Sheet Metal Workers' International Association, SMWIA)

SME ..... Subject matter expert

Standards ..... 2013 California Building Energy Efficiency Standards

TAB ..... Testing, adjusting and balancing

TABB ..... Testing, Adjusting and Balancing Bureau, a function of NEMIC

1. Organization of the NEMIC ATTCP

This section addresses CCR Title 24 Part 1 Section 10-103-B(c)1, i.e., document organizational structure of the ATTCP applicant, including explanations of the organization type, by-laws, and ownership structure.

This section was submitted as part of Submittal 1 of 3 of the subject application to the attention of Mr. Christopher Olvera of the California Energy Commission on October 4, 2013.

1.1 Structure of the NEMIC ATTCP

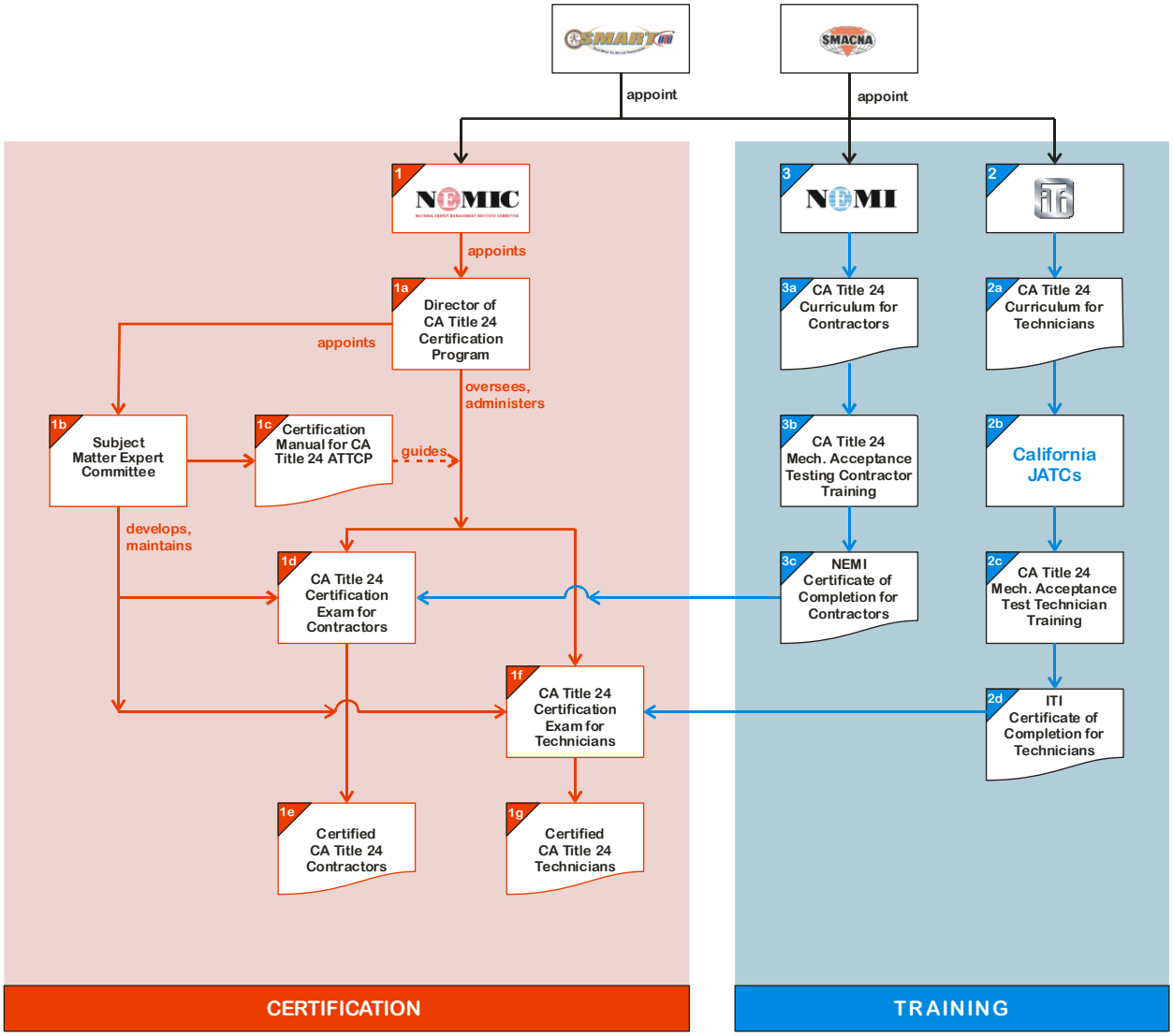
The proposed structure of the NEMIC ATTCP is designed to meet the requirements of CCR Title 24 Part 1 Section 10-103-B(c)3F, i.e., organizational structure that assure quality, independent oversight and accountability, while also meeting the generally accepted definition of a certification program particularly as it conforms to ISO/IEC 17024[1]. ISO/IEC 17024 certification program standards require training and certification to have organizational separation. Accordingly, the NEMIC ATTCP application identifies separate organizational entities to provide training and a "Certificate of Completion" and to provide "certification." The following table depicts the differences between a certification and a certificate of completion and how it is applied to the NEMIC ATTCP.

Certification	Certificate of Completion
Results from an assessment process, here the NEMIC certification exams for both ATEs and ATTs	Results from an educational process, here the ITI and NEMI classes for ATTs and ATEs respectively
Indicates mastery /competency	Indicates completion of a course (s), here training classes by ITI (for ATTs) and NEMI (for ATEs)
Standards set through a defensible, formal process (ISO 17024)	Course content set a variety of ways, here pre-requisite knowledge, classroom and hands-on training
Typically requires some amount of professional experience, here minimum of 3-years of relevant experience	For both newcomers and experienced professionals, here TABB-certification is pre-requisite
Awarded by a third-party, standard-setting organization, here NEMIC	Awarded by training and educational programs or institutions, ITI and NEMI
Has on-going requirements to maintain	Is the end result
What ATE's and ATTs receive after successfully passing their respective certification exams	What ATEs and ATTs receive after completing the NEMI or ITI classes

[1] International Standards Organization. 2003. ISO/IEC 17024 *Conformity assessment – General requirements for bodies operating certifications of persons*.

NEMIC will grant **certifications** to the ATEs and ATTs, while its partners ITI and NEMI will issue *certificates of completion*.

The proposed structure and basic workflow of the NEMIC ATTCP and its training partners is depicted on the following page.



Proposed Structure and Basic Workflow of the NEMIC ATTCP

A detailed explanation of the structure and principal workflow is given below.

1 NEMIC is oversee by a Board of Trustee, half of which are appointed by SMACNA and half by SMART

1a The NEMIC Trustees appoint a director to head the California Title 24 Acceptance Test Certification Program.

1b The Director appoints the Subject Matter Expert Committee members. The task of the SME committee is to develop and maintain the certification program, including developing the Certification Manual as well as the certification examinations for both the ATEs and ATTs.

1c The SME Committee develops and maintains the Certification Manual for the California Title 24 ATTCP Program. The Manual sets forth the rules and regulations that ATEs and ATTs must follow to get certified and to maintain their certifications.

1d The Director administers the certification examination for ATEs following the rules and regulations set forth in the Certification Manual.

1e The ATE candidates will be issued a certification document once they successfully pass the certification examination for ATEs.

1f The Director administers the certification examination for ATTs following the rules and regulations set forth in the Certification Manual.

1g The ATT candidates will be issued a certification document once they successfully pass the certification examination for ATTs.

ICB and TABB are functions of NEMIC. Both maintain the certification programs for NEMIC. The TABB certification for TAB technicians and supervisors is American National Standards Institute (ANSI) accredited under ISO 17024 (ANSI Accreditation 0728). The prerequisite for ATTs to be certified under the NEMIC ATTCP is that they must be TABB-certified. The TABB program's ANSI-ISO 17024 accreditation requires separation of training or teaching functions from the certification program. Thus, the training for ATEs and ATTs is developed and provided by NEMI and ITI respectively.

2 ITI produces a standardized sheet metal curriculum supported by a wide variety of training materials including instructor manuals, student textbooks and workbooks, videos, DVDS, CD-ROMS, and online training.

2a ITI develops and maintains the training materials for the CCR Title 24 acceptance testing program for ATTs.

2b ITI delivers the actual training to two California JATCs, one San Jose and one in the City of Industry. JATCs constitute the local training facilities through which ITI delivers its classes. The facilities provide hands-on-training in state-of-the art labs as well as classroom instructions.

2c The local JATC delivers the Title 24 ATTCP training for ATT candidates. The training will consists of self-paced training modules, classroom review and hands-on training in laboratories.

2d Once the ATT candidate successfully completes all training modules, he or she will be issued a Certificate of Completion. Only then will the candidate be able to take the certification exam for ATTs.

NEMI is an independent contractor to NEMIC and provides training to supervisors and contractors (employers). For the same reasons that ITI will train ATTs, NEMI will train ATEs.

3 NEMI provides training to supervisors and contractors, here ATEs

3a NEMI develops and maintains the training materials for the CCR Title 24 acceptance testing program for ATEs.

3b NEMI delivers the training for the ATE candidates as mandated by CCR Title 24 Part 1 Section 10-103-B(c)3C.

3c Once the ATE candidate successfully completes the training, he or she will be issued a Certificate of Completion. Only then will the candidate be able to take the certification exam for ATEs.

1.2 By-laws

NEMIC is joint labor management trust, which is tax exempt under Code Section 501(c)(6). The NEMIC trustees also are appointed half by SMACNA and half by SMART. A copy of the Trust Agreement is attached (Attachment 1.1).

ITI is an Employee Retirement Income Security Act (ERISA) welfare plan and is tax exempt under Internal Revenue Code Section 501(c)(3). ITI assets are held in Trust, which is administered by a joint board of trustees, half of whom are appointed by SMACNA and half by SMART. A copy of the Trust Agreement is attached (Attachment 1.2). The Board of Trustees is responsible for the administration of the ITI.

NEMI is a District of Columbia Non Profit corporation. NEMI is governed by a Board of Directors, half of whom are appointed SMACNA and half by SMART. The Articles of Incorporation are attached (Attachment 1.3).

1.3 NEMIC Structure

NEMIC's mission is to develop business opportunities for contractors and its smart workforce in a green environment. NEMIC has two certification bodies: the International Certification Board and the Testing, Adjusting and Balancing Bureau. The charters of the ICB and TABB are attached (Attachment 1.4 (ICB & Attachment 1.5 (TABB)).

The organizational structure of NEMIC is shown on the following page.

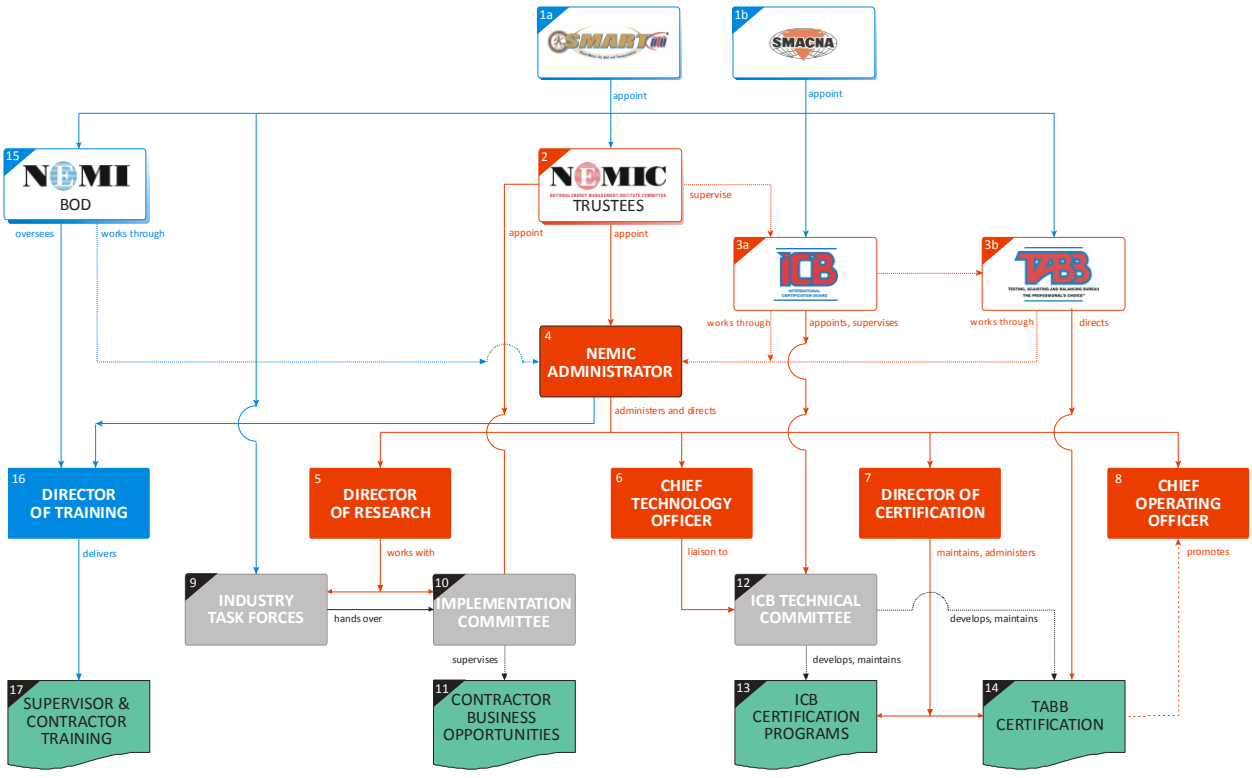
1 NEMIC is a joint labor management trust. Half of the NEMIC trustees are appointed by SMACNA (1b) and the other half by SMART (1a).

2 The NEMIC trustees appoint the NEMIC Administrator. SMACNA and SMART also appoint members to the ICB Board and TABB Board. ICB and TABB are two functions of NEMIC.

3a ICB is a function of NEMIC. ICB's business is managed by a Board of six (6) members, three of which are be appointed by SMART and three by SMACNA. The ICB is, at all times, responsible to and supervised by the Trustees of NEMIC. The mission of the ICB is to direct and implement a comprehensive set of certification programs to assure customers of the sheet metal industry of the quality advantages of utilizing persons or entities certified by the ICB. The ICB appoints and oversees the ICB Technical Committee, which is in charge of developing and maintaining the ICB and TABB certification programs.

3b TABB is a function of NEMIC. TABB's business is managed by a Board of six (6) members, three of which are be appointed by SMART and three by SMACNA. TABB is, at all times, responsible to and supervised by the ICB. The purpose of TABB is to direct and implement a comprehensive certification program of testing, adjusting and balancing contractors and personnel who are eligible for certification under TABB requirements.

ICB and TABB Boards work through the NEMIC Administrator.



Organizational Schematic of NEMIC

4. The NEMIC administrator works with the ICB, TABB and NEMI and administers and oversees its activities. There are four major activities of NEMIC each directed by a responsible person.

5. The Director of Research oversees the direction, operational performance and external relationships of the Industry Task Forces and the Implementation Committee and their work plans.

6. The Chief Technology Officer serves as the technical expert for NEMIC. The CTO leads NEMIC's technology team that identifies new technologies, market developments and trends that will affect skill sets of technicians and contractors. He also serves as the liaison to the ICB Technical Committee.

7 The Director of Certification performs duties and responsibilities within the guidelines established by the International Certification Board. He or she oversees the direction, operational performance and external relationships of the program's work plans. He or she supervises and coordinates office staff activities relating to certification issues including policies and procedures for new certifications, changes to existing certifications, and renewal of existing certifications and data base training.

8. The TABB Chief Operating Officer is responsible for implementation of policies and procedure to TABB. He or she assumes the lead position in promoting TABB to the HVAC industry, national and local level tradeshows and local conventions within the HVAC industry. He or she seeks speaking engagements where TABB can be promoted to HVAC engineers and specifies of construction documents.

9. The Industry Task Forces are constitutes on an as-needed basis. Their members are appointed in equal number by SMART and SMACNA. Their task is to explore emerging markets for contractors and employment opportunities for the smart workforce.

10. The Implementation Committees are instituted on an as-needed basis. Their task is to implement the business opportunities identified by the Industry Task Forces. Their task is to assist contractors to promptly enter an emerging market.

11. The final output of the work of an Implementation Committee is a detailed plan how to enter and merging market.

12 The ICB Technical Committee is charged with the development and maintenance of the various ICB/TABB certification programs. It consists of six subject matter experts appointed by the ICB.

13 The output of the ICB Technical Committee is a series of certification exams in a number of specialty areas including the TABB certification exams for TAB technicians and TAB supervisors.

14. The TABB certification was designed for the sole purpose of providing the HVAC Industry ANSI-accredited testing, adjusting and balancing certification under ISO/IEC 17024 Standard.

15 NEMI is an independent contractor to NEMIC. Its major task is to provide training to supervisors and contractors. At this time, the NEMI Board has elected to work through the NEMIC Administrator in coordinating the training needs of HVAC industry it serves.

16 NEMI is run by the Director of Training who works under the NEMIC Administrator.

17 NEMI's deliverable is training for supervisors and contractors.

2 Certification of Employers

This section addresses CCR Title 24 Part 1 Section 10-103-B(c)2, i.e., document how the NEMIC program includes certification and oversight of Acceptance Test Employers to ensure quality control and appropriate supervision and support for Acceptance Test Technicians.

This section was submitted as part of Submittal 2 of 3 of the subject application to the attention of Mr. Tav Cummins of the California Energy Commission on May 5, 2014.

2.1 Certification Process for Employers

The certification process for Mechanical Acceptance Testing Employers (ATE) has two components:

1. Requirement for training with regard to CCR Title 24 Part 1 Section 10-103-B(c)3C as a prerequisite to take the Mechanical Acceptance Testing Employer Certification exam
2. Passing of the said certification exam

A copy of the Certification Manual which describes all the procedures with regard to certification of ATTs and ATEs is found in Attachment 2.1. This is a public document and will be posted on the ATTCP website. The Certification Manual ("Manual") also lists a number of eligibility requirements that the ATE must meet to be able to take the ATE certification exam (see Section 4.1 of the said Manual).

A copy of the Certification Exam for Mechanical Acceptance Testing Employers has been submitted to the CEC Docket Unit under separate cover with a request for confidentiality.

A copy of the required Acceptance Testing Employer Training Materials as mandated per CCR Title 24 Part 1 Section 10-103-B(c)3C has been submitted to the CEC Docket Unit under separate cover with a request for confidentiality.

2.2 Employer Certification Obligations and Code of Conduct

Each NEMIC-certified Mechanical Acceptance Testing Employer by virtue of his or her certification must meet a number of obligations and must adhere to the Code of Conduct as spelled out in the Certification Manual to maintain his or her certification (see pertinent Section 4.5 *Employer Certification Obligations and Code of Conduct* in the Certification Manual). The objective of the Certification Obligations and the Code of Conduct is to maintain a high level of performance by the Employer throughout the life of his or her certification.

The Obligations section also addresses business operations issues and is designed to provide a high degree of confidence with building code officials and building owners with regard to how the Employers meets his business responsibilities. If the Employers or his or her Technician fails in his obligations or is deficient in his business conduct, the affected parties, i.e., all entities involved in a specific building

projects, such as the building owner, mechanical systems designer, or general contractor, have the option of filing a complaint with NEMIC as outlined in the Certification Manual.

Quality assurance is provided to all parties involved in a project by the virtue of the process of certification of Mechanical Acceptance Testing Employers and their Technicians. In particular

- NEMIC's ATTCP Certification process is independent from other entities, conflicting interests and conflicting activities.
- NEMIC's ATTCP Certification process is impartial. NEMIC does not provide to applicants for certification training or education or related services. Training of Technicians is provided by the International Training Institute and that of Employers by National Energy Management Institute. The certification exams for both Technicians and Employers were developed by a Subject Matter Expert Committee under NEMIC.
- NEMIC's ATTCP Certification process operates in an open and transparent manner. All policies and procedures will be posted on its website for review by interested parties.

3 Training and Certification Procedures for Technicians

This section addresses CCR Title 24 Part 1 Section 10-103- B(c)3A, B, and C:

- Provide a complete copy of all training and testing procedures, manuals, handbooks and materials
- Document how the NEMIC training and certification procedures include both hands-on experience and theoretical training for Acceptance Testing Technicians (ATT).
- Document pre-qualification criteria for ATTs

3.1 Pre-qualifying Technician Training

TAB technicians who wish to become certified by NEMIC as mechanical Acceptance Testing Technicians must be TABB-certified[2]. TABB-certification requires that the technician meets the following qualifications as detailed in the ITI Certification Manual for Technicians (a copy of the Manual is found in Attachment 3.1):

- *"Passed both the written and performance tests as set forth in Section 2.3 of this Manual.*
- *Demonstrated TAB standards of proficiency as set forth in this Manual. "*[3]

As indicated above the certification exam has both a written and a performance component. The written exam is five (5) hours long and covers all the standards of proficiency as outlined in the ITI Certification Manual for Technicians, pages 46 through 51. The candidate must pass the written exam before he or she can take the performance exam. The performance exam consists of two 4-hour sessions. The first session focus on airside systems, while the second one addresses hydronic systems. These are hands-one exams where the candidates are required to test, adjust and balance small model systems which replicate the features and intricacies of large commercial HVAC systems.

At this time, the International Certification Board and the Testing, Adjusting and Balancing Bureau have determined to recognize and accept certifications by the ITI for the ICB/TABB certification program.

TAB technicians who wish to be TABB-certified require a minimum of three years of hands-on (on job) training. Generally, the candidates have more years of hands-on training than the required minimum. In addition to the hands-on training, the candidates will have taken classroom training sessions. The following table lists the standards of proficiency (knowledge base) as detailed in the ITI Certification Manual and compares them to the topics listed in CCR Title 24 Part 1 Section 10-103- B(c)3B.

[2] NEMIC Certification Manual version 140311 page 17. The NEMIC Certification Manual was submitted as part of Submittal 2 of 3 of the subject application to the attention of Mr. Tav Cummins of the California Energy Commission on May 5, 2014.
[3] International Training Institute Certification Manual for Technicians page 46

	Curricula Topics Listed In CCR Title 24 Part 1 Section 10-103- B(C)3B																			
Standards Of Proficiency (Knowledge Base) As Detailed In The ITI Certification Manual For TAB Technicians	**a) Constant volume system controls**	**b) Variable volume system controls**	**c) Air-side economizers**	**d) Air distribution system leakage**	**e) Demand controlled ventilation with CO2 sensors**	**f) Demand controlled ventilation with occupancy sensors**	**g) Automatic demand shed controls**	**h) Hydronic valve leakage**	**i) Hydronic system variable flow controls**	**j) Supply air temperature reset controls**	**k) Condenser water temperature reset controls**	**l) Outdoor air ventilation systems**	**m) Supply fan variable flow controls**	**n) Boiler and chiller isolation controls**	**o) Fault detection and diagnostics for packaged direct-expansion units**	**p) Automatic fault detection and diagnostics for air handling units and zone terminal units**	**q) Distributed energy storage direct-expansion air conditioning systems**	**r) Thermal energy storage systems**	**s) Building Energy Efficiency Standards mechanical acceptance testing procedures**	**t) Building Energy Efficiency Standards acceptance testing compliance documentation for mechanical systems**
Mathematics	X	X		X	X	X				X	X	X	X							
Fluid Flow	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		
Heat Transfer	X	X					X	X	X	X	X	X		X	X	X	X	X		
Psychrometrics	X	X	X		X	X	X			X	X	X		X	X	X	X	X		
Project Documents	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Air Distribution Systems	X	X	X	X	X	X	X					X			X	X	X	X		
Hydronic Distribution Systems							X	X	X		X			X		X	X	X		
Automatic Control Systems	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Electrical Systems	X	X											X							
Instrumentation	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X		
Direct Digital Controls	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X	X		
Preliminary TAB Procedures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Air System TAB Procedures	X	X	X	X	X	X	X					X			X	X	X	X		
Specific Air System Procedures	X	X	X	X	X	X	X			X		X	X		X	X	X	X		
Hydronic System TAB Procedures							X	X	X		X			X		X	X	X		
Considerations for TAB																				
Reference Data	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

As shown in the table above, the standards of proficiency for TABB-certified technicians cover all training curricula for Mechanical Acceptance Test Technicians in analysis, theory, and practical application mandated by the 2013 Title 24 Building Energy Efficiency Standards.

Topics listed as points s) Building Energy Efficiency Standards mechanical acceptance testing procedures; and t) Building Energy Efficiency Standards acceptance testing compliance documentation for mechanical systems in the table on page 3 are addressed in Section 3.2.

3.2 Training for Acceptance Testing Technicians

3.2.1 Classroom Training

Training for mechanical Acceptance Testing Technicians encompasses classroom training with hands-on demonstration in all mechanical acceptance tests as specified by 2013 Title 24 Part 6 Section 120.5 – Required Nonresidential Mechanical System Acceptance. The training encompasses 20 modules:

- Module 1 - Overview of the CA Building Standards
- Module 2 - Overview of the Mechanical Acceptance Testing Requirements
- Module 3 - Overview of the Mechanical Acceptance Testing Technician Training & Certification Process
- Modules 4 – 20: Test Procedures for Mechanical Systems according to Appendix NA7 – *Installation and Acceptance Requirements for Nonresidential Buildings and Covered Processes, NA7.5 Mechanical Systems Acceptance Tests* NA7.5.1 through NA7.5.16

A copy of the training modules in PowerPoint format is in Attachment 3.2.

3.2.2 Hands-on Training

The Sheet Metal Workers Locals 104 and 105, which cover all of California, in conjunction with the California Association of Sheet Metal and Air Conditioning Contractors' National Association (CAL SMACNA) jointly fund and operate the following Joint Apprenticeship Training Centers (JATC):

- Bakersfield
- City of Industry
- Fairfield
- Fresno
- Modesto
- Monterey
- Sacramento
- San Diego
- San Jose
- San Leandro
- Ventura

Each JATC features classrooms and laboratories, where apprentices and journeymen (technicians) receive hands-on training. Attachment 3.3 documents a typical JATC with various HVAC equipment and systems and indicates on what specific pieces of equipment the respective mechanical acceptance test will be trained upon.

3.3 Certification of Mechanical Acceptance Testing Technicians

Certification of mechanical Acceptance Testing Technicians and their employers is documented in the NEMIC ATTCP Certification Manual, which was included in Submittal 2 of 3 of the subject application to the attention of Mr. Tav Cummins of the California Energy Commission on May 5, 2014.

The Certification Manual details the eligibility requirements each candidate must meet prior to being allow to take the ATTCP certification exam. These include, i.e., the applicant must be:

- ICB/TABB-certified in testing, adjusting and balancing
- Holds an ITI certificate of completion of having received training on mechanical acceptance testing mandates and procedures as specified by the latest version of the California Building Energy Efficiency Standards.

A copy of the Technician Certification Exam is found in Attachment 3.4.

3.4 Instructor to Trainee Ratio

This section addresses CCR Title 24 Part 1 Section 10-103-B(c)3B(iv), i.e., the ATTCP shall document in its application to the Energy Commission why its instructor to trainee ratio is sufficient based on industry standards and other relevant information.

As indicated in Section 1 of the subject application, the training function is provided by International Training Institute for Acceptance Testing Technician candidates and by National Energy Management Institute for Acceptance Testing Employer candidates.

The training programs and materials offered by ITI are the result of an employee welfare benefit plan established on May 12, 1971 to fund the training and development of apprentices and workers in the sheet metal industry. ITI commits to:

- Provides and maintains training and retraining programs
- Conducts train-the-trainer programs
- Develops and distributes training materials designed to improve the quality of workmanship and productivity in the sheet metal industry, including training to meet the 2013 California Building Standards

- Investigates, researches and monitors changing technology and specialty fields to meet the ever-evolving demands of a dynamic industry

NEMI has been training contractor since 1981.

The instructor to ratio depends if the instructions are classroom only or if they include hands-on training in the laboratories / shop floor. Historically, both ITI and NEMI have maintained a 1-20 instructor-to-trainees ratio for classroom instructions. That ratio changes significantly when hands-on training is involved. In laboratory / shop floor hands-on instructions the instructor-to-trainees ratio is 1 to 6-12. As the training of the Mechanical Acceptance Testing Technician candidates includes hands-on instructions as well, the instructor-to-trainees ratio will be about 1-10.

3.5 Technician Coverage of the State of California

The map on the following page shows the number of TABB-certified technicians in the state of California by county. As of this moment, there are 294 TABB-certified testing, adjusting and balancing technicians in California. This number will exceed 300 by the time NEMIC anticipates having gained approval as an ATTCP by the California Energy Commission.

3.6 Industry Coverage

This section addresses Title 24, Part 1, Section 10-103-B (b) 2. *Industry Coverage by Certification Provider(s)*.

NEMIC's legal status as an industry trust fund dictates the all benefits must flow to its members. Members of NEMIC are signatory employers (contractors) who make contributions to NEMIC on behalf of its employees; here it would be TABB-certified technicians, and ultimately, certified mechanical Acceptance Testing Technicians.

To gain ANSI accreditation under ANSI/IEC/ISO 17024 NEMIC had to demonstrates that that any prequalified member of the HVAC industry, which includes but is not limited to HVAC installing and servicing contractors, mechanical contractors, TAB contractors, controls contractors, commissioning agents and professional engineers, are able to become signatory members of NEMIC. Given that NEMIC has and will continue to operate as an ANSI accredited personal certification provider industry coverage is assured as mandated by Title 24, Part 1, Section 10-103-B (b) 2.

NATIONAL ENERGY MANAGEMENT INSTITUTE COMMITTEE

ATTCP Districts

Number of TABB-certified testing, adjusting and balancing technicians in the State of California by county.

4 Complaint Procedures

This section addresses CCR Title 24 Part 1 Section 10-103-B(c)3D, i.e., document how the NEMIC will implement procedures for notifying building departments and the public that the NEMIC will accept complaints regarding the performance of any certified acceptance test technician or employer, and procedures for how the NEMIC will address these complaints..

This section was submitted as part of Submittal 2 of 3 of the subject application to the attention of Mr. Tav Cummins of the California Energy Commission on May 5, 2014.

The Complaint Procedure is fully documented in the Certification Manual, Section 2.6 *ATTCP Procedures for Resolution of Complaints* (see Attachment 2.1). The ATTCP website will provide a guideline how to submit a complaint regarding conduct or performance of a NEMIC-certified Mechanical Acceptance Testing Technician or his or her Employer.

5 Revocation Procedures

This section addresses CCR Title 24 Part 1 Section 10-103-B(c)3E, i.e., document how the NEMIC will implement procedures for revoking the certification of Acceptance Test Technicians and Employers based upon poor quality or ineffective work, failure to perform acceptance tests, falsification of documents, failure to comply with the documentation requirements of these regulations for the issuance of building permits or other specified actions that justify decertification..

This section was submitted as part of Submittal 2 of 3 of the subject application to the attention of Mr. Tav Cummins of the California Energy Commission on May 5, 2014.

The Revocation Procedures are fully documented in the Certification Manual, Section 2.4 *Suspension or Withdrawal of Certification,* Section 3.5 *Decertification* (of Technicians) and Section 4.6 *Decertification* (of Employers) (see Attachment 2.1).

6 Quality Assurance Program

This section addresses CCR Title 24 Part 1 Section 10-103-B(c)3F, i.e., document how the NEMIC certification business practices include quality assurance, independent oversight and accountability measures such as third party oversight of the certification processes and procedures, visits to building sites where certified technicians are completing acceptance tests, certification process evaluations, building department surveys to determine acceptance testing effectiveness, and expert review of the training curricula developed for Title 24, Part 6 Building Energy Efficiency Standards, Section 120.5.

6.1 Rationale for the Proposed QA Program

The proposed quality assurance (QA) program will be a paper audit only program. The rationale for this program is as follows.

A) Section CCR Title 24 Part 1 Section 10-103-B(c)3F list site visits where certified ATT are completing acceptance tests as a potential component of the QA. In its discussion with NEMIC the CEC staff also expressed a strong desire for such a component. The NEMIC ATTCP cannot guarantee that a site visit by an NEMIC QA auditor to building site where certified ATTs are performing mechanical acceptance is feasible. Not being a legal party to the construction process, any access to a building site would require the concurrence by the building owner, the general contractor, the architect and/or engineer of record. Furthermore, QA auditors do not have the legal standing of a building code official. Thus, the NEMIC ATTCP cannot design a QA program where site visits can be routinely refused.

B) The NEMIC QA program is built upon the TABB QA program. Any mechanical ATT candidate must be a TABB-certified TAB technician prior to taking the ATT training classes or the ATT certification exam. Thus, any and all certified ATT will also be governed by the TABB QA program. The TABB-certification is accredited by ANSI under IEC/ISO Standard 17024 *Conformity assessment – General requirements for bodies operating certification of persons* (see Attachment 6.1)

3. The TABB-certification contains QA elements which exceed and supplement that of the proposed NEMIC ATTCP QA program (see Attachment 3.1 ITT Certification Manual for Technician).
   - The TABB certification contains a Code of Conduct. Every contractor, supervisor or technician must comply with the Code of Conduct as a requirement for maintaining certification. Violations of the Code of Conduct are grounds for suspension, withdrawal or non-renewal of certification.
   - TABB certification must be renewed every two years. To renew their certification TABB-certified technician must presents documents that he or she has completed the required number of Continuing Education Units (CEUs).
   - The TABB certification includes a process for addressing complaints concerning work or conduct, such as a breach of the ICB Code of Conduct or other ICB standards; or use (or

alleged misuse) of any certification documents, including an identification stamp if applicable (see Attachment 6.2. ICB Certification Manual). The ICB reserves the right to investigate the work that was performed by the TABB-certified technician and if found deficient, the ATT and his employers must take steps to remedy it. The NEMIC ATTCP QA program does not remove those ICB standards.

The ICB/TABB certification encompasses a QA program that is more stringent than the ATTCP one and it runs parallel to the ATTCP one. In addition to being audited at least one within a code cycle as an ATT, at a minimum the ATT will also undergo at least one and potentially two audits by ICB/TABB as part of his or her TABB-certification.

6.2 NEMIC ATTCP QA Program

The QA program will be a paper only audit. Its process and elements are:

1. Every audit will review five (5) percent of each type of completed mechanical acceptance forms with a minimum of five (5) forms per each type and not to exceed ten (10) forms per each type.
2. The following table that shows the number of forms per type of mechanical tests performed to be audited.

Number of Mechanical Acceptance Forms Completed of Each Type	Number of Forms to be Audited
1 - 109	5
110 - 129	6
130 – 149	7
150 – 169	8
170 – 199	9
200 and greater	10

3. The forms to be audited will be generated randomly by the Registry.
4. The first audit of a certified ATT will be performed with 12 months after the ATT's certification date.
5. After the first audit, each ATT will be audited once within a code cycle, i.e., every three years.
6. If the ATT fails an audit, he or she will be decertified. He or she can reapply for certification upon completing the required mechanical ATT training classes.
7. If the ATE, who employed the "failed" ATT has more than one ATT working for the firm, an audit will be performed on another ATT working for the same ATE. If that ATT fails the audit as well, he or she will be decertified along with the ATE. The audit will follow the format as described under point 1). The ATE can reapply for certification upon completing the required mechanical ATE training classes.

8. The paper audits will be performed by subject matter experts, i.e., TAB supervisors with current TABB certifications or retired TAB supervisors who held the TABB supervisor certification for a minimum of five years, and who will be trained in the requirements of the California Building Energy Standards.
9. The results of each audit will be reported to the Registry.

An example of how this audit process would work. Let us assume that the ATT has completed the following mechanical acceptance tests since his last audit and they included the following forms (this example is indicative of an ATT that does a substantial amount of acceptance tests):

Mechanical Acceptance Form	Number Completed Since Last Audit	Number of Forms to be Audited
NRCA-MCH-02-A – Outdoor Air Acceptance	112	6
NRCA-MCH-03-A – Constant Volume, Single Zone, Unitary Air Conditioner and Heat Pump Systems	52	5
NRCA-MCH-04-A – Air Distribution Systems Acceptance	0	0
NRCA-MCH-05-A – Air Economizer Controls Acceptance	112	6
NRCA-MCH-06-A – Demand Control Ventilation Systems Acceptance	0	0
NRCA-MCH-07-A – Supply Fan VFD Acceptance	70	5
NRCA-MCH-08-A – Valve Leakage Test	54	5
NRCA-MCH-09-A – Supply Water Temperature Reset Controls Acceptance	54	5
NRCA-MCH-10-A – Hydronic System Variable Flow Control Acceptance	54	5
NRCA-MCH-11-A – Automatic Demand Shed Control Acceptance	28	5
NRCA-MCH-12-A – Fault Detection & Diagnostics (FDD) for Packaged Direct Expansion Units	26	5
NRCA-MCH-13-A – Automatic Fault Detection & Diagnostics (FDD) for Air Handling Units & Zone Terminal Units Acceptance	0	0
NRCA-MCH-14-A – Distributed Energy Storage DX AC Systems Acceptance	0	0
NRCA-MCH-15-A – Thermal Energy Storage (TES) System Acceptance	0	0
NRCA-MCH-16-A – Supply Air Temperature Reset Controls Acceptance	13	5
NRCA-MCH-17-A – Condenser Water Supply Temperature Reset Controls Acceptance	13	5
NRCA-MCH-18-A – Energy Management Control System Acceptance	13	5
Totals	**601**	**62**

The audit would include 62 of 601 forms the ATT completed, i.e., a total of over 10% of the mechanical acceptance forms the ATT had completed since his or her last audit.

6.3 Accreditation Program for Personnel Certification Bodies under ANSI/ISO/IEC 17024

The American National Standards Institute (ANSI) currently administers two accreditation programs for personnel certification agencies. The first accreditation program is based on the International Standard ANSI/ISO/IEC 17024 and the second is based on The Conference for Food Protection Accreditation Standards for certification agencies that certify food protection managers.

The process used by ANSI to accredit certification bodies is based on an international standard (ISO/IEC 17011). Adherence to a rigorous internationally recognized accreditation process ensures that the ANSI process conforms to the highest accreditation standard and represents the best practices in accreditation. ANSI is the only personnel certification accreditation body in the United States to meet nationally accepted practices for accreditation bodies.

The ANSI accreditation process involves both a review of a paper application and the performance of an assessment (onsite visit) to validate information provided by each applicant. The use of an onsite assessment for accreditation of personnel certification agencies is unique to ANSI.

Close to one million professionals currently hold certifications from organizations accredited under ANSI's personnel certification programs.

ANSI accreditation is recognized both nationally and internationally and has become the hallmark of a quality certification program. Unique features of ANSI accreditation are:

- ANSI accreditation involves not only review of the submitted material but also a site visit to ensure that compliance with the requirements and verify documents that have been submitted prior to the on-site visit. Due to a high degree of integrity and confidence that is associated with ANSI accreditation process, ANSI accreditation is generally recognized as the highest standard in personnel certification accreditation.
- The standard used by ANSI to accredit certification bodies is an American National Standard as well as an ISO/IEC Standard. Accreditation to an international standard is extremely important for certification bodies that have global operations or aspirations. The American National Standard is important to facilitate government recognition.
- ANSI follows an internationally recognized process for accrediting organizations. ANSI conducts its accreditation in accordance with the requirement of ISO/IEC 17011-Conformity Assessment - General Requirements for Accreditation Bodies accrediting Conformity Assessment Bodies. This International Standard is the foundational Standard that is used to recognize ANSI accreditation in any multilateral and/or mutual recognition agreements.
- ANSI has a historical track record of successfully conducting accreditation of certification programs drawn from different industrial sectors from not-for-profits, large multinational corporations, and government agencies (in process).

U.S. Government Recognition

The U.S. Government is increasingly relying on ANSI accreditation for verification of quality of certification programs and to control fraud and misuse in certain industries. In view of the proliferation of certification programs and the need to help the consumers make informed decisions, government agencies are looking to ANSI accreditation to differentiate quality programs and improve practices in industry. The ANSI accreditation process is designed to increase the integrity, confidence, and mobility of certified professionals. Some of the government agencies that are closely associated with ANSI accreditation include:

- Food and Drug Administration
- Department of Defense
- State Regulation
- Massachusetts Securities Commission
- Occupational Safety and Health Administration

TABB Reports to ANSI

Attachment 6.3 lists three reports which are required by ANSI to review and assess the performance of the TABB certification for testing, adjusting and balancing technicians and supervisors. TABB-certification in testing, adjusting and balancing is a prerequisite for technicians to become certified as a mechanical Acceptance Testing Technician.

6.4 Annual Surveys of Building Departments With Regard To Mechanical Acceptance Testing

NEMIC will develop a database of all building departments and building officials in the state of California. The primary purpose of the database is to be able to electronically communicate with the building officials and notify them of the activities of the NEMIC ATTCP as well as provide the building officials with an up-to-date listing of certified mechanical Acceptance Testing Technicians and their employers as well as any changes to the certification status of a technician or his/her employer.

The same database will be employed to conduct annual surveys of the building officials with regard to mechanical acceptance testing. The survey instrument is yet to be developed and will be drafted in conjunction with the California Energy Commission staff.

7 Certification Identification Number and Verification of ATT Status

This section addresses CCR Title 24 Part 1 Section 10-103-B(c)3G, i.e., document how the NEMIC will issue a unique certification identification number to the ATT; maintain an accurate record of the certification status for all ATTs that the NEMIC has certified; provide verification of current ATT certification status upon request to authorized document Registration Provider personnel or Enforcement Agency personnel to determine the ATT's eligibility to sign Certificate of Acceptance documentation according to all applicable requirements in Sections 10-103-B, 10-102, 10-103(a)4, and Reference Joint Appendix JA7.

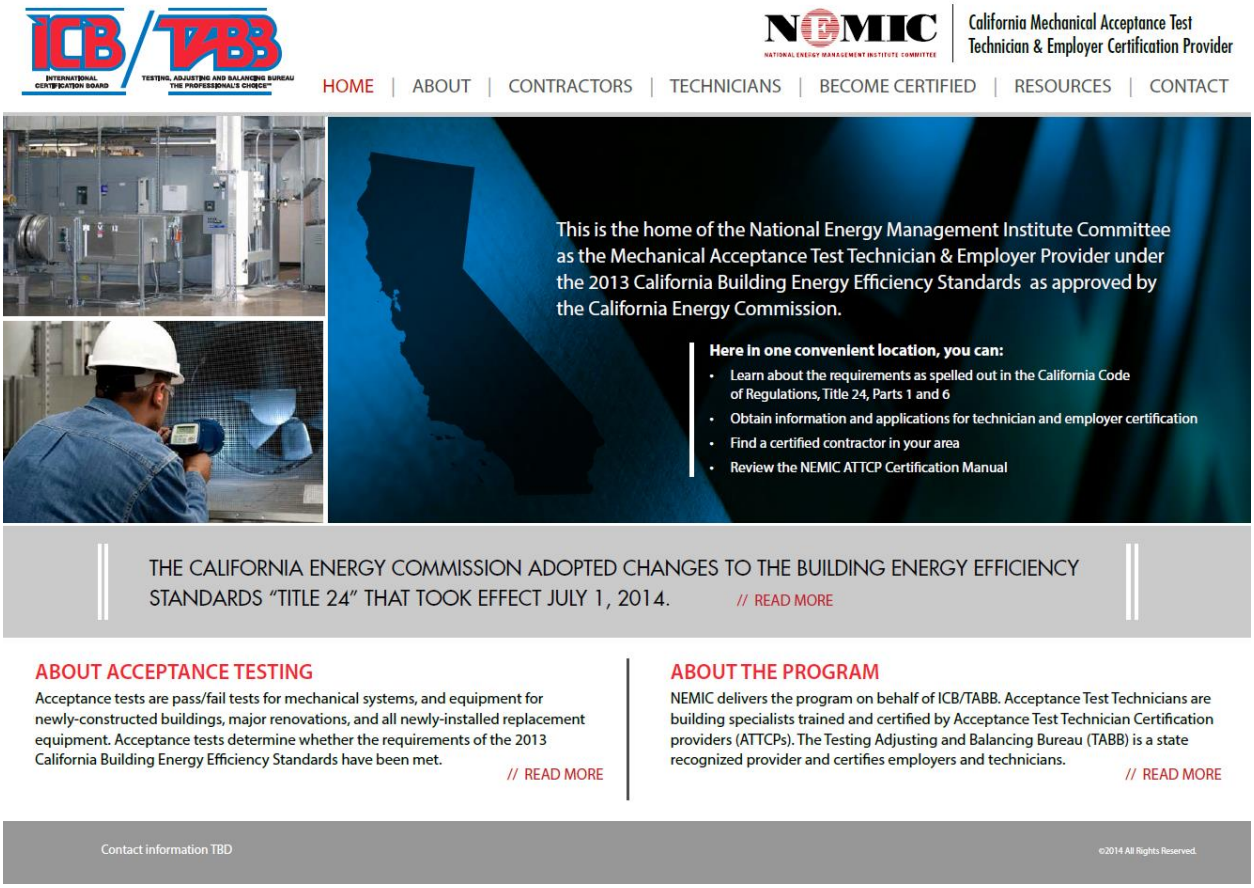
The NEMIC ATTCP will maintain a website at http://www.attcp.org and http://www.nemic-attcp.org, which will: (a) be a repository for all information concerning the NEMIC ATTCP, its certification procedures, (b) provide a listing of each certified ATT and ATE, (c) provide a mechanism for filing complaints regarding the performance of ATTs and (d) provide other pertinent information. Each ATT candidate who has passed the certification exam will be assigned a unique certification number. The website will be linked to a database of certified ATTs and ATEs and the ATT will be linked to his or her ATE by the certification number. The database will be accessible to the Enforcement Agency personnel and the public.

The proposed certification id for a mechanical Acceptance Testing Technician is MTxxxxx, where xxxxx is a sequential number. Similarly the proposed certification id for a mechanical Acceptance Testing Employer is MEyyyyy where yyyyy is a sequential number.

The website listing will display the certification status of each ATT and ATE as well. The certification status will be expressed as:

- *Certification is current*. This status is expressed when the ATT and its respective employer both have successfully passed their respective certification exams or have both successfully renewed their respective certification as stated in the NEMIC Certification Manual.
- *Certification is on hold and under review*. This status is expressed when the ATT's certification or that of his/her respective employer are under review according to Sections 2.4 and 2.7 of the NEMIC Certification Manual.
- *Certification is revoked*. This status is expressed when the ATT's certification or that of his/her respective employer have been revoked according to Sections 2.4 and 2.7 of the NEMIC Certification Manual.

A sample of the www.attcp.org home page is shown on the following page. The database of registered ATTs and ATEs will share that information with the Registry. Other enhancements to the website will be made as information needs are recognized. The website will be operational within 90 days once the California Energy Commission approves NEMIC as Acceptance Test Technician Certification Provider.



Draft of the homepage of the NEMIC ATTCP website.

8 Annual Reports

This section addresses CCR Title 24 Part 1 Section 10-103-B(d), i.e., document how NEMIC will

a. Provide an annual report to the Energy Commission summarizing the certification services provided over the reporting period, including the total number of Acceptance Test Technicians and Employers certified by the agency (a) during the reporting period and (b) to date.
b. Report to the Energy Commission what adjustments have been made to the training curricula, if any, to address changes to the Building Energy Efficiency Standards Acceptance Testing requirements, adopted updates to the Building Energy Efficiency Standards or to ensure training is reflective of the variety of lighting controls that are currently encountered in the field, no less than six months prior to the effective date of any newly adopted, or amendment to existing Building Energy Efficiency Standards.

The Administrator of the NEMIC ATTCP will fulfill this reporting function. At a minimum the report will include:

- A list of certified Acceptance Testing Technicians and their respective certified Acceptance Testing Employers. The list will indicated the certification status as listed in Section 7 of this document.
- A list of all adjustments to the certification process if any were made
- A list of all adjustments to the training curricula if pertinent changes have been made to the Building Energy Efficiency Standards.
- The reporting period will be from January 1 through December 31 of the year of interest and the report will be delivered by March 31 of the following year.

9 Interim Approval Training for TABB members

This section addresses CCR Title 24 Part 1 Section 10-103-B(e), i.e., document the training NEMIC partner ITI will provide to TABB-certified HVAC professionals for the following mechanical acceptance tests required in Building Energy Efficiency Standards, Section 120.5.

a. NA7.5.1 Outdoor Air Ventilation Systems
b. NA7.5.2 Constant Volume, Single Zone Unitary Air Conditioners and Heat Pumps
c. NA7.5.4 Air Economizer Controls
d. NA7.5.5 Demand Control Ventilation Systems
e. NA 7.5.6 Supply Fan Variable Flow Controls
f. NA7.5.7, NA7.5.9 Hydronic System Variable Flow Controls
g. NA7.5.10 Automatic Demand Shed Controls

This section was submitted as part of Submittal 1 of 3 of the subject application to the attention of Mr. Christopher Olvera of the California Energy Commission on October 4, 2013.

9.1 Background

To maintain its ANSI ISO 17024 accreditation for the TABB certification, NEMIC cannot provide training for technicians or contractors. Thus, NEMIC has contracted with ITI to provide training to technicians. The training programs and materials offered by ITI are the result of an employee welfare benefit plan established on May 12, 1971 to fund the training and development of apprentices and workers in the sheet metal industry. ITI's role is to:

- Provide and maintain training and retraining programs
- Conduct train-the-trainer programs
- Develop and distribute training materials designed to improve the quality of workmanship and productivity in the sheet metal industry
- Investigate, research and monitor changing technology and specialty fields to meet the ever-evolving demands of a dynamic industry

9.2 Interim Approval Training Materials for TABB-certified Technicians

ATT candidates that hold a valid TABB-certification may receive training in accordance with CCR Title 24 Part 1 Section 10-103-B(e).. The TABB certification is a prerequisite for such training. To obtain TABB certification, the technician has to pass an 8-hour hands on exam and a 5-hour written exam, which test the candidate's knowledge and skill in testing, adjusting and balancing airside and hydronic systems.

TABB certification provides all the underlying knowledge and hands on training necessary to perform the following mechanical acceptance tests required in the Title 24 Standards: NA7.5.1, NA7.5.2, NA7.5.4, NA7.5.5, NA7.5.6, NA7.5.7, NA7.5.9 and NA7.5.10. TABB certification does not, however, provide instruction on the requirements of the Title 24 mechanical acceptance tests. Accordingly, CCR Title 24 Part 1 Section 10-103-B(e) requires TABB technicians who apply to be certified as ATTs to undergo additional training on the Building Energy Efficiency Standards acceptance testing procedures and compliance documentation prior to taking the ATT Certification exam.

Training which addresses the mechanical acceptance tests in CCR Title 24 Part 1 Section 10-103-B(e) have been designed by ITI to be delivered in several formats. The basic one is a constructor led classroom presentation using Microsoft's PowerPoint® platform. Attachments 9.1 through 9.9 present this basic platform. The following table list the individual training modules.

Acceptance Test	Attachment No.
NA7.5.1.1 Variable Air Volume Outdoor Air Ventilation Systems	9.1
NA7.5.1.2 Constant Air Volume Outdoor Air Ventilation Systems	9.2
NA7.5.2 Constant Volume, Single Zone Unitary Air Conditioners and Heat Pumps	9.3
NA7.5.4 Air Economizer Controls	9.4
NA7.5.5 Demand Control Ventilation Systems	9.5
NA 7.5.6 Supply Fan Variable Flow Controls	9.6
NA7.5.7 Valve Leakage Acceptance	9.7
NA7.5.9 Hydronic System Variable Flow Control Acceptance	9.8
NA7.5.10 Automatic Demand Shed Controls	9.9

At this time it is envisioned to further develop these training modules into a self-paced online training format.

9.3 Proprietary Nature of Training Materials

NEMIC and its training partners consider all training documents developed for and submitted under this Application to be trade secrets. Furthermore, disclosure to parties not members of the ITI may be in violation of the Employee Retirement Income Security Act as benefits develop for members of ITI may only benefit them. At this time, NEMIC on behalf of ITI has submitted *Application for Confidential Designation* in accordance with CCR Title 20 § 2505 et seq. encompassing all training materials submitted under Section 9 of this Application. The *Application for Confidential Designation* requests that Attachments 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8 and 9.9 be designated confidential and withheld from public disclosure.

Attachments

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Attachment 1.1. NEMIC Trust Agreement

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Attachment 1.2. ITI Trust Agreement

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Attachment 1.3. NEMI Articles of Incorporation

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Attachment 1.4.Charter of the International Certification Board

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Attachment 1.5.Charter of the Testing, Adjusting and Balancing Bureau

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Attachment 2.1. ATTCP Certification Manual

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Attachment 2.2. Mechanical Acceptance Testing Employer Training Materials

[Confidential Proprietary Document – Not for Public Disclosure]

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Attachment 2.3. Mechanical Acceptance Testing Employer Certification Exam

[Confidential Proprietary Document – Not for Public Disclosure]

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Attachment 3.1. ITI Certification Manual for Technicians

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Attachment 3.2. Mechanical Acceptance Testing Technician Training Materials

[Confidential Proprietary Document – Not for Public Disclosure]

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Attachment 3.3. Typical Hands-on Mechanical Acceptance Testing Technician Training Facility

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Attachment 3.4. Mechanical Acceptance Testing Technician Certification Exam

[Confidential Proprietary Document – Not for Public Disclosure]

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Attachment 6.1. ANSI Certificate of Accreditation

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Attachment 6.2 ICB Certification Manual

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Attachment 6.3.TABB Reports to ANSI

[Confidential Proprietary Document – Not for Public Disclosure]

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Attachments 9.1. Training Module Addressing NA7.5.1 Variable Air Volume Systems Outdoor Air Acceptance

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Attachments 9.2. Training Module Addressing NA7.5.1 Constant Air Volume Systems Outdoor Air Acceptance

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Attachments 9.3. Training Module Addressing NA7.5.2 Constant Volume, Single Zone Unitary Air Conditioners and Heat Pumps

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Attachments 9.4. Training Module Addressing NA7.5.4 Air Economizer Controls

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Attachments 9.5. Training Module Addressing NA7.5.5 Demand Control Ventilation Systems

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Attachments 9.6. Training Module Addressing NA 7.5.6 Supply Fan Variable Flow Controls

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Attachments 9.7. Training Module Addressing NA7.5.7 Valve Leakage Acceptance

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Attachments 9.8. Training Module Addressing NA7.5.9 Hydronic System Variable Flow Control Acceptance

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Attachments 9.9. Training Module Addressing NA7.5.10 Automatic Demand Shed Controls

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